

PERFORMANCE

Processor

Processor Family

Up to one Intel® Xeon®, Core™ i9, i7, i5, or i3 processor

Processor

Processor Name	Cores	Threads	Base Frequency	Max Frequency	Cache	Memory Support	Processor Graphics
Pentium® Gold G5620	2	4	4.0GHz	-	4MB	DDR4-2400	Intel UHD Graphics 630
Core i3-8100	4	4	3.6GHz	-	6MB	DDR4-2400	Intel UHD Graphics 630
Core i3-8300	4	4	3.7GHz	-	8MB	DDR4-2400	Intel UHD Graphics 630
Core i3-9100	4	4	3.6GHz	4.2GHz	6MB	DDR4-2400	Intel UHD Graphics 630
Core i3-9100F	4	4	3.6GHz	4.2GHz	6MB	DDR4-2400	-
Core i3-9300	4	4	3.7GHz	4.3GHz	8MB	DDR4-2400	Intel UHD Graphics 630
Core i5-8500	6	6	3.0GHz	4.1GHz	9MB	DDR4-2666	Intel UHD Graphics 630
Core i5-9400	6	6	2.9GHz	4.1GHz	9MB	DDR4-2666	Intel UHD Graphics 630
Core i5-9400F	6	6	2.9GHz	4.1GHz	9MB	DDR4-2666	-
Core i5-9500	6	6	3.0GHz	4.4GHz	9MB	DDR4-2666	Intel UHD Graphics 630
Core i5-9600	6	6	3.1GHz	4.6GHz	9MB	DDR4-2666	Intel UHD Graphics 630
Core i5-9600K	6	6	3.7GHz	4.6GHz	9MB	DDR4-2666	Intel UHD Graphics 630
Core i7-8700	6	12	3.2GHz	4.6GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i7-8700K	6	12	3.7GHz	4.7GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i7-9700	8	8	3.0GHz	4.7GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i7-9700K	8	8	3.6GHz	4.9GHz	12MB	DDR4-2666	Intel UHD Graphics 630
Core i9-9900	8	16	3.1GHz	5.0GHz	16MB	DDR4-2666	Intel UHD Graphics 630
Core i9-9900K	8	16	3.6GHz	5.0GHz	16MB	DDR4-2666	Intel UHD Graphics 630
Xeon E-2174G	4	8	3.8GHz	4.7GHz	8MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2186G	6	12	3.8GHz	4.7GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2224	4	4	3.4GHz	4.6GHz	8MB	DDR4-2666	-
Xeon E-2224G	4	4	3.5GHz	4.7GHz	8MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2226G	6	6	3.4GHz	4.7GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2234	4	8	3.6GHz	4.8GHz	8MB	DDR4-2666	-
Xeon E-2236	6	12	3.4GHz	4.8GHz	12MB	DDR4-2666	-
Xeon E-2244G	4	8	3.8GHz	4.8GHz	8MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2246G	6	12	3.6GHz	4.8GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2274G	4	8	4.0GHz	4.9GHz	8MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2276G	6	12	3.8GHz	4.9GHz	12MB	DDR4-2666	Intel UHD Graphics P630
Xeon E-2278G	8	16	3.4GHz	5.0GHz	16MB	DDR4-2666	Intel UHD Graphics P630

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Xeon E-2286G	6	12	4.0GHz	4.9GHz	12MB	DDR4-2666	Intel UHD Graphics P630
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Processor Sockets

1x FCLGA1151

Operating System

- Windows® 10 Pro 64
- Windows 10 Pro 64 for Workstations
- Ubuntu Linux LTS
- No operating system

Graphics

Integrated Graphics

- Intel UHD Graphics 630
- Intel UHD Graphics P630
- None

Discrete Graphics Support

Supports up to one NVIDIA® Quadro® RTX 4000, or two NVIDIA Quadro P2200, 400W PSU is needed

Discrete Graphics Offering

Graphics	Memory	Power	Connector	SLI / NVlink
Quadro P400	2GB GDDR5	30W	3x miniDP	None
Quadro P620	2GB GDDR5	40W	4x miniDP	None
Quadro P1000	4GB GDDR5	50W	4x miniDP	None
Quadro P2000	5GB GDDR5	75W	4x DP	None
Quadro P2200	5GB GDDR5	75W	4x DP	None
Quadro P4000	8GB GDDR5	120W	4x DP	None
Quadro P5000	16GB GDDR5X	180W	1x DVI-D DL, 4x DP	None
Quadro RTX 4000	8GB GDDR6	160W	3x DP, 1x VirtualLink	None

Monitor Support

Supports multiple displays via onboard video ports and discrete graphics

Chipset

Intel C246 chipset

Memory

Memory Type

- DDR4-2666 UDIMM ECC
- DDR4-2666 UDIMM non-ECC

Memory Slots

4 DIMM sockets with 2 channels

Memory Protection

ECC on models with ECC DIMMs and Xeon processor

Max Memory

Up to 64GB

Notes:

- The max memory is based on the test results with current Lenovo® memory offerings. The system may support more memory as the technology develops.

Storage

Storage Support

Up to 3x 3.5" SATA HDD / 4x 2.5" SATA HDD / SSD + 3x M.2 PCIe SSD

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- 3.5" HDD up to 4TB each
- 2.5" SATA HDD up to 500GB each
- 2.5" SATA SSD up to 1TB each
- M.2 SSD up to 1TB each
- Optional Intel Optane™ Memory

Storage Controllers

Storage Controller	Type	Interface	RAID	Cache
Onboard Intel RST SATA RAID	Standard	SATA 6.0Gb/s	0/1/10/5	None
Onboard Intel RST PCIe RAID	Standard	PCIe NVMe	0/1	None

Storage Type

Disk Type	Interface	RPM	Offering
3.5" SATA HDD	SATA 6Gb/s	7.2K	1TB/2TB/4TB
2.5" SATA HDD	SATA 6Gb/s	7.2K	500GB FIPS
2.5" SATA SSD	SATA 6Gb/s	-	256GB/512GB/1TB
M.2 PCIe SSD	PCIe 4.0 NVMe	-	256GB/512GB/1TB
Optane Memory	PCIe NVMe	-	32GB

Removable Storage

Optical Support

Optional one 9.0mm optical drive, DVD-ROM, DVD±RW, and Blu-ray

Card Reader

- SD card reader
- Not configured

Multi-Media

Audio Chip

High Definition (HD) Audio, Realtek® ALC233 codec

Power Supply

Power	Type	Efficiency	Key Features
250W	Fixed	92%	100V - 240V, Climate Savers Computing Platinum and 80 PLUS Platinum qualified
400W	Fixed	92%	100V - 240V, Climate Savers Computing Platinum and 80 PLUS Platinum qualified

DESIGN

Mechanical

Form Factor

Tower (18L)

Dimensions (WxDxH)

165 x 328 x 376 mm (6.5 x 12.9 x 14.8 inches)

Weight

9.8 kg (21.61 lbs)

Bays

- 1x slim ODD bay
- 1x 2.5" disk bay
- 2x 3.5" disk bay
- 1x 3.5" disk bay (optional, via 5.25" to 3.5" HDD Kit or removable Front Access Storage Enclosure)

Flex Bays

1x Flex bay, supports one of the following:

- Flex module for optional front eSATA/Thunderbolt™/IEEE1394

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- 3rd disk bay, 3.5" or 2.5", removable, via Front Access Storage Enclosure, using SATA 4 connector as eSATA mode
- 3rd disk bay, 3.5" or 2.5", via 5.25" to 3.5" HDD Kit

M.2 Slots

Up to 3x M.2 SSD:

- 1 via onboard slot
- 2 via Single M.2 to PCIe adapter

Expansion Slots

- Two PCIe 3.0 x16
- One PCIe 3.0 x1

Expansion Slots Offering

Slot 1: PCIe 3.0 x16, full height, half length, links to CPU

Slot 2: PCIe 3.0 x1, full height, full length, links to PCH

Slot 3: PCIe 3.0 x16 (negotiable link width x4), full height, half length, links to PCH

CONNECTIVITY

Network

Onboard Ethernet

Gigabit Ethernet, Intel Ethernet Connection I219-LM, 1x RJ45, supports Wake-on-LAN

Optional Ethernet

Additional Ethernet options via PCIe adapter

WLAN + Bluetooth™

- Intel Wireless-AC 9560, 802.11ac Dual Band 2x2 Wi-Fi + Bluetooth 5.1, M.2 card
- Not configured

Ports

Front Ports

- 2x USB 3.1 Gen 1
- 2x USB 3.1 Gen 2
- 1x USB-C 3.1 Gen 1
- 1x headphone / microphone combo jack (3.5mm)
- 1x microphone (3.5mm)

Notes:

- The transfer speed of following ports will vary and, depending on many factors, such as the processing speed of the host device, file attributes and other factors related to system configuration and your operating environment, will be slower than theoretical speed.

USB 2.0: 480 Mbit/s;

USB 3.2 Gen 1 (SuperSpeed USB 5Gbps, formerly USB 3.0 / USB 3.1 Gen 1): 5 Gbit/s;

USB 3.2 Gen 2 (SuperSpeed USB 10Gbps, formerly USB 3.1 Gen 2): 10 Gbit/s;

USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s;

Thunderbolt 3: 40 Gbit/s;

FireWire 400: 400 Mbit/s;

FireWire 800: 800 Mbit/s;

Optional Front Ports

- 1x eSATA (with flex module)
- 2x Thunderbolt (with flex module, USB-C form, one supports video-out)
- 1x IEEE1394 (with flex module)

Rear Ports

- 2x USB 2.0
- 2x USB 3.1 Gen 1
- 1x serial (9-pin)
- 1x Ethernet (RJ-45)
- 1x line-out (3.5mm)
- 2x DisplayPort™

Notes:

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- For video ports on discrete graphics, please see graphics section
- DP needs Core, Pentium, or -G suffix Xeon processor

Optional Rear Ports

- 1x video (DisplayPort or HDMI®)
- 2x USB 2.0
- 2x USB 3.1 Gen 1 (via 2-port USB expansion card)
- 2x USB-C 3.1 Gen 1 (via 2-port USB-C expansion card)
- 1x Thunderbolt
- 1x serial
- 4x serial (via 4-port serial expansion card, PCIe x1)
- 1x parallel
- 2x PS/2

SECURITY & PRIVACY

Security

Security Chip

Discrete TPM 1.2, TCG certified

Physical Locks

- (Optional) E-lock
- (Optional) Cable lock
- Kensington® Security Slot
- Padlock Loop

Chassis Intrusion Switch

- Chassis intrusion switch
- Not configured

BIOS Security

- Power-on password
- Administrator password

MANAGEABILITY

System Management

- Intel vPro with Intel AMT 12 (vPro-enable processor and WiFi needed)
- Standard Manageability

SERVICE

Warranty

Base Warranty

- 1-year limited onsite service
- 3-year limited onsite service
- No base warranty

ENVIRONMENTAL

Environmental Specifications

Temperature

Operating: 10° C to 35° C (50° F to 95° F)

Storage: -40°C to 60°C (-40°F to 140°F) in original shipping carton

Storage: -10°C to 60°C (14°F to 140°F) without carton

Altitude

Operating: -15.2m to 3048m (-50ft to 10000ft)

Storage: -15.2m to 10668m (-50ft to 35000ft)

Humidity

Relative Humidity Operating: 10% to 80% (non-condensing)
Relative Humidity Storage/Transit: 10% to 90% (non-condensing)
Wet Bulb Temperature Operating: 25°C (77°F) max
Wet Bulb Temperature Non-operating: 40°C (104°F) max

CERTIFICATIONS

Green Certifications

- EPEAT™ Silver
- ENERGY STAR® 8.0
- GREENGUARD®
- RoHS

ISV Certifications

Please visit www.thinkworkstations.com/isv-certifications/

